

## COMBINED APPARATUS FOR DRY CLEANING OF GASES

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In the works [1 – 2] has been proposed a concept which considers a construction and process, in a complex, which proceed in the main device of dust cleaning; of hydrodynamic and processes which occurring in a gas-dispersed system in pipelines before entering into the main apparatus, as well as at the branch pipe for discharging dust and purified gas. Thus, according to the concept, complex system is consider "supply-cleaning process-gas outlet" as a whole, taking into account the mutual influence.

In the work, proposed construction of a dust-cleaning apparatus, which provides for the combination of the reaction chamber, which provides intensive collision of dust particles in the chamber and their agglomeration, with a separation chamber in the form of a straight-flow cyclone. It has been established the operability of the proposed design.

It was found that during processing, due to the high speeds and intensity of collisions of dust particles, was had agglomerate processes occur with an increase in particle size of 5 – 6 times. It was established possibility of physicochemical transformation of gas-dispersed impurities in the stream at a sufficiently high temperature of the stream. It was  $\text{NO}_x$ ,  $\text{SO}_2$ ,  $\text{CO}$ ,  $\text{HCl}$ ,  $\text{HF}$  in the presence of excess  $\text{H}_2\text{O}$  vapor or sprayed solutions  $\text{H}_2\text{O}_2$ ,  $\text{NaOH}$ . However, an excessive amount of these substances corresponds to the stoichiometric ratio between the reagents.

It were been investigated the hydrodynamic characteristics of the separation chamber of the gas cleaning apparatus. We have been established, that the dust collection coefficient reaches 94 – 98%, depending on its physicochemical properties of dust. Thus, the results of experimental studies have shown that the targeted pretreatment of the gas-dispersed flow before entering the gas cleaning apparatus can significantly improve the efficiency of trapping dust particles

The use of the proposed design in separation systems is expedient, and requires further research in this direction.

### References:

1. Shaporev V., Pitak I., Pitak O., Briankin S. Study of functioning of vortex tube with a two-phase flow// Eastern-European journal of enterprise technologies 4/10 (88) 2017 p. 51–60.
2. Pitak I., Briankin S., Pitak O., Shaporev V. Analysis of the sanitary purification of gas emissions from dust in the lime manufacture// "Eureka: Physics and Engineering". №5. 2017 p. 65–72.